

CLAIMS

1. (Original) Spheroidal cast iron comprising the following elements: Fe, C, Si, Mo and characterized in that it furthermore comprises Ni, RE, and at least one element among Ti, V, Nb.

2. (Original) The spheroidal cast iron according to claim 1, characterized in that the elements of the group formed by Ti, V and Nb are present in percentages by weight that range from 0.1% to 2.00% of the total weight of the cast iron.

3. (Original) The spheroidal cast iron according to one or more of the preceding claims, characterized in that it comprises said elements in the following percentages by weight: 3.20 – 4.20% C, 2.00 – 4.00% Si, up to 0.10% P, up to 0.10% S, up to 0.20% Mn, up to 1.30% Cu, up to 0.50% Cr, 1.7% to 5.00% Ni+RE, 0.10 – 2.00% Mo, 0.1% to 2.0% of the sum of the percentages of the elements of the group constituted by Ti, V and Nb, and up to 0.20% Co.

4. (Original) The spheroidal cast iron according to one or more of the preceding claims, characterized in that the remaining percentage by weight in order to reach the value of 100% of the weight is constituted by Fe.

5. (Original) The spheroidal cast iron according to one or more of the preceding claims, characterized in that it is subjected to a heat treatment, known as austempering, which comprises an austenitization treatment followed by an isothermal hardening treatment.

6. (Withdrawn) A process suitable to obtain a spheroidal cast iron according to at least one of claims 1 to 5, comprising the steps that consist in:

- providing a conventional basic cast iron
- melting the base cast iron
- checking the molten metal during the preparation and completion of the melting of the basic cast iron by taking samples, which undergo chemical analyses in order to check their composition
- adding chemical elements chosen from the class that comprises C, Si, P, S, Mn, Cu, Mo, Cr, Ni, Ti, V, Nb

-- inoculating spheroidizing agents in the molten mass, said agents being constituted by a silicon base which comprises RE with the addition of at least one of the elements chosen from the class that comprises Mg, Ca, Ce, Ta, Sr, Al, RE.

7. (Withdrawn) The process for obtaining a spheroidal cast iron according to one or more of the preceding claims, characterized in that it comprises an austenitization treatment with a holding time of up to 120 minutes at a temperature of 840-1000 °C and an isothermal hardening (austempering) treatment with holding of the cast iron for 5 to 100 minutes at a temperature of 250-450 °C.

8. (Withdrawn) The process for obtaining a spheroidal cast iron according to claim 7, characterized in that said austenitization treatment also comprises a thermal strain relieving treatment at a temperature that is higher than the temperature of said isothermal hardening treatment.

9. (Withdrawn) The spheroidal cast iron according to one or more of the preceding claims, characterized in that it has a matrix structure of the bainitic-austenitic type with an austenite percentage substantially comprised between 20 and 40%.

10. (Withdrawn) A piston ring, particularly for pistons of internal-combustion engines, characterized in that it is made of an austempered spheroidal cast iron according to one or more of the preceding claims.